SIM82XX_SIM83XX Series _HTTP(S)_Application Note

5G Module

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About Document

Version History

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Scope

This document applies to the SIMCom SIM820X series, SIM821X series, SIM826X series and SIM83XX series.

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Contents

About Document 3

Version History 3
Scope 3

Contents 4

1 Introduction 5

1.1 Purpose of the document 5
1.2 Related documents 5
1.3 Conventions and abbreviations 5

2 HTTP Introduction 6

2.1 Characteristic 6
2.2 Request Method 6

3 AT Commands for HTTP(S) 8

4 Bearer Configuration 9

4.1 PDN Auto-activation 9

5 HTTP(S) Examples 11

5.1 HTTP Function 11
5.1.1 HTTP GET 11
5.1.2 Send HTTP POST Request 12
5.1.3 Send HTTP HEAD Request 13
5.2 Access to HTTPS server 14
5.2.1 Send HTTPS GET Request 14
5.2.2 Send HTTPS POST Request 15
5.2.3 Send HTTPS HEAD Request 16
5.2.4 POST FILE to HTTPS server and read HTTPS response content to a file 17

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1 Introduction

1.1 Purpose of the document

Based on module AT command manual, this document will introduce HTTP(S) application process. Developers could understand and develop application quickly and efficiently based on this document.

1.2 Related documents

[1] SIM82XX_SIM83XX Series_AT Command Manual

1.3 Conventions and abbreviations

In this document, the GSM engines are referred to as following term:
ME (Mobile Equipment);
MS (Mobile Station);
TA (Terminal Adapter);
DCE (Data Communication Equipment) or facsimile DCE (FAX modem, FAX board);

In application, controlling device controls the GSM engine by sending AT Command via its serial interface. The controlling device at the other end of the serial line is referred to as following term:
TE (Terminal Equipment);
DTE (Data Terminal Equipment) or plainly "the application" which is running on an embedded system;

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2 HTTP Introduction

HTTP (HyperText Transfer Protocol) is an application layer protocol. When you browse a web page, the browser and the web server will send and receive data on the Internet through the HTTP protocol. HTTP is a stateless protocol based on request and response patterns. That is what we usually call Request/Response.

2.1 Characteristic

- **Support client/server mode;**
  - **Simple and fast**

When a client requests a service from a server, it only needs to pass the request method and path. Because the HTTP protocol is simple, the program size of the HTTP server is small, and the communication speed is fast.

  - **Flexible**

HTTP allows the transfer of any type of data object. The type being transferred is marked by Content-Type;

  - **No connection**

No connection means limiting the processing of only one request per link. After the server processes the client's request and receives the customer's response, the server disconnects the link. This way, the transmission time can be saved.

  - **Stateless**

The HTTP protocol is a stateless protocol. Stateless means that the protocol has no memory for transaction processing. A lack of state means that if subsequent processing requires the previous information, it must be retransmitted, which may result in an increase in the amount of data transferred per connection. On the other hand, it responds faster when the server does not need previous information.

2.2 Request Method

According to the HTTP standard, HTTP requests can use a variety of request methods.
HTTP 1.0 defines three request methods: the GET, POST, and HEAD methods.
HTTP1.1 adds six new request methods: OPTIONS, PUT, PATCH, DELETE, TRACE, and CONNECT

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methods.

No	Method	Description
1	GET	Make a request to a specific resource.
2	HEAD	Ask the server for a response that is consistent with the GET request, except that the response body will not be returned. This method can obtain the meta information contained in the response message header without having to transmit the entire response content.
3	POST	Submit data to a specified resource for processing requests (such as submitting a form or uploading a file). The data is included in the request body. POST requests may result in the creation of new resources and/or modifications to existing resources.
4	PUT	Uploads its latest content to a specified resource location.
5	DELETE	Requests the server to delete the resource identified by the Request-URI.
6	CONNECT	H The HTTP/1.1 protocol is reserved for proxy servers that can connect connections to pipes.
7	OPTIONS	Returns the HTTP request method supported by the server for a particular resource. You can also test the functionality of the server by sending a '*' request to the web server.
8	TRACE	Echoes requests received by the server, primarily for testing or diagnostics.
9	PATCH	It is a supplement to the PUT method for local updating of known resources.

The SIM8200 series supports several methods: GET, POST and HEAD.

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3 AT Commands for HTTP(S)

Command	DESCRIPTION
AT+HTTPPARA	Set HTTP(S) Parameter
AT+HTTPINIT	Start HTTP(S) service
AT+HTTPACTION	HTTP(S) Method Action
AT+HTTPHEAD	Read the HTTP Header Information of Server Response
AT+HTTPREAD	Read the response Information of Server Response
AT+HTTPDATA	You can use AT+HTTPDATA to input data to post when you send a HTTP/HTTPS POST request
AT+HTTPPOSTFILE	Send HTTP request in a file via AT+HTTPPOSTFILE command
AT+HTTPREADFILE	Receive HTTP Response Content to a file
AT+HTTPTERM	Stop HTTP service.

For detail information, please refer to " SIM82XX_SIM83XX_Series_AT Command Manual".

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4 Bearer Configuration

Usually module will register PS service automatically.

4.1 PDN Auto-activation

```
AT+CPIN?
+CPIN: READY                                          // Check Status of SIM Card

OK
AT+CSQ
+CSQ: 27,99                                           // Check RF Signal

OK
AT+CGREG?
+CGREG: 0,1                                           // Check Status of PS Service

OK
AT+CEREG?
+CEREG: 0,1

OK
AT+COPS?
+COPS: 0,0,"CHN-UNICOM",13                            // Check Information of Operator

OK
AT+CPSI?
+CPSI:  NR5G_SA,Online,460-00,0x161816,13190066179,476,NR5G
_BAND41,504990,-1130,-140,30                          // Check Information of Network

OK
AT+CGDCONT=1, "IP", "CMNET"                           // Set PDP context Parameters
OK
AT+CGDCONT?
+CGDCONT:
1,"IPV4","CMNET","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0   // Check Information of PDP Context
```

```
OK
```

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5 HTTP(S) Examples

5.1 HTTP Function

5.1.1 HTTP GET

// Following commands shows how to send a HTTP GET request to server, and how to read HTTP response.	
AT+HTTPINIT **OK**	// start HTTP service, activate PDP context
AT+HTTPPARA="URL","http://opinion.people.com.cn/GB/n1/2018/0815/c1003-30228758.html" **OK**	// set the URL which will be accessed, for HTTP, the request URL begins with “HTTP://”
AT+HTTPACTION=0 **OK** **+HTTPACTION: 0,200,22505**	// send HTTP GET request // 22505 is the length of HTTP response information
AT+HTTPHEAD **+HTTPHEAD: DATA,387** **HTTP/1.1 200 OK** **Server: nginx** **Content-Type: text/html** **Connection: close** **Date: Thu, 16 Aug 2018 05:13:36 GMT** **Powered-By-ChinaCache: MISS from 06053423gG.15** **ETag: W/"5b7379f5-57e9"** **Last-Modified: Wed, 15 Aug 2018 00:55:17 GMT** **Expires: Thu, 16 Aug 2018 05:18:36 GMT** **Vary: Accept-Encoding** **X-Cache-Hits: 14** **Content-Length: 22505** **CC_CACHE: TCP_REFRESH_HIT** **Accept-Ranges: bytes**	// read the HTTP response header

```
OK
AT+HTTPREAD=0,16                    // read 16 bytes form response data
OK                                  //data content：<!DOCTYPE html P

+HTTPREAD: DATA,16
<!DOCTYPE html P
+HTTPREAD: 0
AT+HTTPTERM                         // stop HTTP Service
OK
```

5.1.2 Send HTTP POST Request

```
// HTTP POST and PUT

AT+HTTPINIT                         // start HTTP service, activate PDP context
OK
AT+HTTPPARA="URL","http://api.efxnow.com/   //set the URL which will be accessed, for HTTP,
DEMOWebServices2.8/Service.asmx/Echo?"      the request URL begins with “HTTP://”
OK
AT+HTTPDATA=18,1000                 // send data to post, the length is 18 bytes
DOWNLOAD
Message=helloworld
OK
AT+HTTPACTION=1                     // send HTTP POST request
OK                                  // 30 is the length of HTTP response information

+HTTPACTION: 1,500,30

+HTTP_PEER_CLOSED
AT+HTTPHEAD                         // read the HTTP response header
OK
+HTTPHEAD: DATA,258
HTTP/1.1 500 Internal Server Error
Cache-Control: private
Content-Type: text/plain; charset=utf-8
Server: Microsoft-IIS/7.0
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
Date: Mon, 20 Aug 2018 04:18:58 GMT
Connection: close
```

Content-Length: 30 OK AT+HTTPTERM OK	 // stop HTTP Service

5.1.3 Send HTTP HEAD Request

// HTTP HEAD	
AT+HTTPINIT OK	// start HTTP service, activate PDP context
AT+HTTPPARA="URL","http://opinion.people.com.cn/GB/n1/2018/0815/c1003-30228758.html" OK	// set the URL which will be accessed, for HTTP, the request URL begins with “HTTP://”
AT+HTTPACTION=2 OK +HTTPACTION: 2,200,387 +HTTP_PEER_CLOSED	//send a HEAD request to server to only get header of HTTP response
AT+HTTPHEAD +HTTPHEAD: DATA,387 HTTP/1.1 200 OK Server: nginx Content-Type: text/html Connection: close Vary: Accept-Encoding Powered-By-ChinaCache: MISS from 06053423gG.15 ETag: W/"5b7379f5-57e9" Last-Modified: Wed, 15 Aug 2018 00:55:17 GMT Content-Length: 22505 X-Cache-Hits: 14 Date: Thu, 16 Aug 2018 10:58:00 GMT Expires: Thu, 16 Aug 2018 11:03:00 GMT CC_CACHE: TCP_REFRESH_HIT Accept-Ranges: bytes	// read the HTTP response header

```
OK
AT+HTTPTERM                                   // stop HTTP Service
OK
```

5.2 Access to HTTPS server

5.2.1 Send HTTPS GET Request

```
//HTTPS GET

AT+HTTPINIT                                   //start HTTP service, activate PDP context
OK
AT+HTTPPARA="URL","https://ss0.bdstatic.com/5aV1bjqh_Q23odCf/static/mancard/css/card_min_dee38e45.css"
                                              // set the URL which will be accessed, for HTTPS, the request URL begins with “HTTPS://”
OK
AT+HTTPACTION=0                               // send HTTPS GET request
OK

+HTTPACTION: 0,200,52060
AT+HTTPHEAD                                   // read HTTPS response header
+HTTPHEAD: DATA,390                           //390 is the length of HTTPS response header
HTTP/1.1 200 OK
Server: bfe/1.0.8.13-sslpool-patch
Date: Thu, 16 Aug 2018 11:38:08 GMT
Content-Type: text/css
Content-Length: 52060
Connection: close
ETag: "5a323f72-cb5c"
Last-Modified: Thu, 14 Dec 2017 09:08:02 GMT
Expires: Sat, 18 Aug 2018 09:50:53 GMT
Age: 2425635
Accept-Ranges: bytes
Cache-Control: max-age=2592000
Vary: Accept-Encoding
Ohc-Response-Time: 1 0 0 0 0 0
```

OK	
AT+HTTPREAD=0,24	
OK	
+HTTPREAD: DATA,24	
.s-cardsetting{position:	
+HTTPREAD: 0	
AT+HTTPTERM	// stop HTTP Service
OK	

5.2.2 Send HTTPS POST Request

//HTTPS POST	
AT+HTTPINIT	//start HTTP service, activate PDP context
OK	
AT+HTTPPARA="URL","https://pv.csdn.net/csdnbi"	// set the URL which will be accessed, for HTTPS, the request URL begins with “HTTPS://”
OK	
AT+HTTPDATA=465,1000	// send data to post, the length is 465 bytes
DOWNLOAD	
[{"headers":{"component":"enterprise","datatype":"track","version":"v1"},"body":"{\"re\":\"uid=merry1996&ref=https%3A%2F%2Fpassport.csdn.net%2Faccount%2Fverify%3Bjsessionid%3D7895A57BC64CE8616517F558940FD913.tomcat2&pid=www&mod=&con=&ck=-&curl=https%3A%2F%2Fwww.csdn.net%2F&session_id=10_1534696351647.160829&tos=12&referrer=https%3A%2F%2Fpassport.csdn.net%2Faccount%2Fverify%3Bjsessionid%3D7895A57BC64CE8616517F558940FD913.tomcat2&user_name=merry1996&type=pv\"}"}]	
OK	
AT+HTTPACTION=1	//send HTTPS post request
OK	//2 is the length of HTTPS response information
+HTTPACTION: 1,200,2	
+HTTP_PEER_CLOSED	
AT+HTTPHEAD	//read the HTTPS response header
+HTTPHEAD: DATA,377	

HTTP/1.1 200 OK
Server: openresty
Date: Mon, 20 Aug 2018 03:20:30 GMT
Content-Type: application/octet-stream
Connection: close
Set-Cookie:
uuid_tt_dd=10_37481894210-1534735230305-445993; Expires=Thu, 01 Jan 2025 00:00:00 GMT; Path=/; Domain=.csdn.net;
Set-Cookie:
dc_session_id=10_1534735230305.501284; Expires=Thu, 01 Jan 2025 00:00:00 GMT; Path=/; Domain=.csdn.net;
 	
OK	

AT+HTTPTERM OK	// stop HTTP Service

5.2.3 Send HTTPS HEAD Request

// HTTPS HEAD	
AT+HTTPINIT OK	//start HTTP service, activate PDP context
AT+HTTPPARA="URL","https://ss0.bdstatic.com/5aV1bjqh_Q23odCf/static/mancard/css/card_min_dee38e45.css" OK	//set the URL which will be accessed, for HTTPS, the request URL begins with “HTTPS://”
AT+HTTPACTION=2 OK +HTTPACTION: 2,200,390 +HTTP_PEER_CLOSED	// send HTTPS HEAD request
AT+HTTPHEAD +HTTPHEAD: DATA,390 HTTP/1.1 200 OK Server: bfe/1.0.8.13-sslpool-patch Date: Thu, 16 Aug 2018 11:46:22 GMT Content-Type: text/css Content-Length: 52060	// read HTTPS response header

```
Connection: close
ETag: "5a323f72-cb5c"
Last-Modified: Thu, 14 Dec 2017 09:08:02 GMT
Expires: Sat, 18 Aug 2018 09:50:53 GMT
Age: 2426129
Accept-Ranges: bytes
Cache-Control: max-age=2592000
Vary: Accept-Encoding
Ohc-Response-Time: 1 0 0 0 0 0


OK
AT+HTTPTERM                                  //stop HTTP Service
OK
```

5.2.4 POST FILE to HTTPS server and read HTTPS response content to a file

```
// HTTPS POST/PUT

AT+HTTPINIT                                  /// start HTTP service, activate PDP context
OK
AT+HTTPPARA="URL","https://www.baidu.com"    //access server and send file getbaidu.txt to server
OK
AT+HTTPPOSTFILE="getbaidu.txt",1,0           // access server and send file getbaidu.txt to server
OK

+HTTPPOSTFILE: 0,200,14615

+HTTP_PEER_CLOSED
AT+HTTPHEAD                                  // read the HTTP server response header information.
+HTTPHEAD: DATA,773
HTTP/1.1 200 OK
Accept-Ranges: bytes
Cache-Control: no-cache
Connection: Keep-Alive
Content-Length: 14615
Content-Type: text/html
Date: Thu, 13 Sep 2018 05:14:30 GMT
Etag: "5b8641dc-3917"
Last-Modified: Wed, 29 Aug 2018 06:49:00 GMT
P3p: CP=" OTI DSP COR IVA OUR IND COM "
Pragma: no-cache
```

```
Server: BWS/1.1
Set-Cookie:
BAIDUID=A374BCFD28DFEEAF0BA0C4EEAC
77B0B0:FG=1; expires=Thu, 31-Dec-37
23:55:55 GMT; max-age=2147483647; path=/;
domain=.baidu.com
Set-Cookie:
BIDUPSID=A374BCFD28DFEEAF0BA0C4EEA
C77B0B0; expires=Thu, 31-Dec-37 23:55:55
GMT; max-age=2147483647; path=/;
domain=.baidu.com
Set-Cookie: PSTM=1536815670; expires=Thu,
31-Dec-37 23:55:55 GMT;
max-age=2147483647; path=/;
domain=.baidu.com
Vary: Accept-Encoding
X-Ua-Compatible: IE=Edge,chrome=1

OK
AT+HTTPTERM                          // stop HTTPS Service
OK
```

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